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# 20 TAKE-HOME LESSONS FROM PERFORMANCE CONTRACTING

## *"Lessons Learned" from Two Rebuild Hawaii Partnerships*

Maurice Kaya—program administrator of the State of Hawaii's Energy, Resources and Technology division, Hawaii Department of Business, Economic Development & Tourism (DBEDT)—first heard about the Rebuild America program in the mid-1990's. In recalling his impressions of the program in 2000, Kaya said, "Rebuild America sounded like the perfect deployment platform for delivering community-based services, such as performance contracting for energy retrofits, to towns and cities in Hawaii."

Energy Program Specialist Elizabeth Raman, in DBEDT's Energy, Resources and Technology Division, was selected as the program representative for the State of Hawaii when DBEDT signed up "Rebuild Hawaii State" in 1997. Shortly after this partnership was founded, the State recognized that one government agency with limited resources would find it impossible to reach all segments of the community simultaneously. Thus, in early 1998, the "Rebuild Hawaii Consortium" was established as a part of the State's Rebuild America partnership through the leadership of Kaya, who currently serves as Consortium President.

The ultimate goal of the Consortium is to implement innovative solutions, such as performance contracting, to resolve energy/resource efficiency issues, especially in the underserved low-income housing and small business sectors. Successful implementation of energy efficiency projects can be better achieved by working with utilities, government programs and entities, community political and business leaders, private industry and energy service companies (ESCOs).

### PERFORMANCE GUARANTEED?

Many government agencies and private business owners face increasing energy costs and the need to replace equipment that has exhausted its useful life, but lack the funds to make building improvements. Members of the Rebuild Hawaii Consortium are pursuing energy efficiency through various delivery mechanisms. Many projects are funded by a combination of state, county and local government funds; federal grants; private sector in-kind services; and cash. Other sources of financing include tax exempt and commercial leases through performance contracting, and agency budgets.

Performance contracting is fairly straightforward. It is an agreement between a building owner (or facilities manager) and a private ESCo that lets future energy savings pay for the entire cost of a building's energy efficiency retrofits. A building owner contracts with an ESCo that then designs, purchases, installs and maintains energy-saving equipment. The ESCo will also guarantee that the energy savings achieved—which may include replacing lighting equipment, modifying or replacing boilers and chillers, installing modern energy management control systems or replacing motors—will pay for all project costs.

In theory, performance contracting should help finance energy retrofits, create incentives for private industry, and alleviate liability assumption on the part of the community partnership. According to Raman, "The [performance contracting] program meets the goal of our energy program to increase the productivity of our economy and our existing infrastructure by increasing the use of

more energy-efficient technologies in the public and private sectors.” In reality, performance contracting has been successful in several Rebuild Hawaii Consortium projects, and not-so-successful in others.

## THE BAR RAISED

Kaya and Raman hope that Hawaii’s performance contracting successes would inspire other partnerships to use this innovative financing tool for retrofits. The first energy performance contract for State facilities—at the University of Hawaii at Hilo—was deemed successful upon its completion in December 1997. The project was estimated to produce over \$6.6 million in energy and other cost savings over the term of the contract, save \$450,000 annually on utility bills from lighting and air-conditioning improvements, and provide an additional \$1.6 million in direct and indirect income to the State economy. A comprehensive maintenance plan was included to upgrade and return existing equipment to maintainable condition and to promote an ongoing preventative maintenance program with an average value of \$200,000 per year.

In June 1999, the first annual savings reconciliation confirmed that a \$2.9 million investment by a well-known ESCo had exceeded guaranteed annual savings estimates by \$83,000.

With these encouraging results, Raman envisioned using performance contracting for even better returns on energy investments. She notes, “When all State partnerships have completed their efficiency programs, they will result in an investment of \$19 million in facility improvements and an average annual cost

savings to the State government of \$4 million, as well as \$16 million in direct and indirect income to the economy. In addition, these retrofits will result in an annual reduction of 44,000 tons of carbon dioxide.”

Case studies from two Rebuild Hawaii Consortium community partnerships—County of Kauai and Hawaii Department of Education—illustrate less successful results from performance contracting, partly due to the fact that the project managers had not encountered this type of energy efficiency financing and implementation tool before. Following are 20 take-home performance contracting lessons gleaned from these two Rebuild Hawaii partnerships, which offer solid recommendations to avoid some of the pitfalls encountered.

## CASE STUDY #1: COUNTY OF KAUAI

**Background:** The County of Kauai community partnership started in 1995, with Kauai County’s Energy Coordinator Glenn Sato in charge. Rebuild Kauai’s primary goal was to bundle all government facilities—including public works, wastewater, and water—to be considered for performance contracting. From the lessons learned and through its successes, the County then planned to move the performance contracting concept out into the private sector. The move to the private sector was envisioned to include technical support, networking and educational support.

None of the County agencies involved in the Kauai Rebuild America project had experience with performance contracting. This made the “buy-in” that much more difficult. Sato hired performance contract-

ing expert Dr. Shirley Hanson from Hanson Associates, to develop a strategic plan to evaluate and implement the community partnership’s performance contracting needs. Dr. Hanson has written numerous books and articles about performance contracting and is a speaker at workshops and conferences.

The goals of Hanson’s plan were to educate the staff and decision-makers about energy efficiency, develop and host workshops to allow participants to ask questions about performance contracting and energy matters. The next step was to put together a Request for Proposal (RFP) for performance contracting and advertise it to prospective ESCos.

The performance contract was divided into three phases. The first phase included all buildings under the Department of Public Works, Building Division. The second phase covered the Department of Public Works, Wastewater Division and the third phase included all Water Department facilities.

By the beginning of 2000, Rebuild County of Kauai had retrofitted 29 county facilities/buildings under its Building Division with energy-saving equipment with a total investment of \$525,000. Over the 10-year project period (1998-2008), \$680,000 in energy and operational cost savings was projected. The performance contract with Wastewater did not materialize because the energy savings could not pay for program costs. Water Department data collection also determined that cost savings could not pay for the retrofits.

Following is the first set of lessons learned, from Rebuild County of Kauai:

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## LESSON #1—DETERMINE FAIR METHOD OF RISK ASSIGNMENT

One of the first issues to be addressed by the Kauai partnership was, “Whose contract do we use?” Of course, each ESCo would prefer to use its own, but the partnership preferred to have one that guaranteed more objectivity. A key issue was indemnification, and each party had specific concerns about liability as expressed by legal counsel. Traditionally, attorneys and financial managers have been rather “risk averse.”

The County felt that the language that the ESCo wanted was too broad. The ESCo language indemnified the company for any “indirect, special, consequential” damages, which in the County’s viewpoint, absolved the ESCo of any responsibility for damages caused by negligence and the damages that follow.

On the other hand, the ESCo felt that they would be viewed as the “deep pocket” multi-billion dollar company that would be a target for frivolous third-party lawsuits. After months of proposals and counter-proposals, the parties settled on a joint indemnification clause.

## LESSON #2—INSIST ON A DETAILED LIST OF ESCO EXPENSES

A second contract issue was receiving an exact listing of expenses detailed on the contract. Many of the ESCos involved with the Kauai RFP elected to provide their general expenses set at sometimes vaguely-defined “industry standards.” The County’s agreement with the selected ESCO required that the prices quoted would be shown to be “reasonable.” In order for the County to be comfortable with the project costs, it was necessary to have a detailed price breakdown.

Sato insisted that each ESCo provide a clearer definition of industry standards, so the partnership could stay better informed and the ESCo would be held more accountable. Sato referred to a National Association of Energy Service Companies (NAESCO) publication that could satisfy everyone’s need to set industry standard expenses more objectively than an individual ESCo could. “I could not understand how NAESCO could have a method to break down costs associated with a project and the ESCo had a reluctance to show their true costs.”

Ultimately, the ESCo detailed out the costs to show subcontractor costs, equipment purchases, profit margins, overhead, etc. “We needed to exercise our due diligence to prove to our administrators that the ESCo costs were verifiable and reasonable. The only way to do this was to have a detailed cost breakdown,” says Sato.

## LESSON #3—EVALUATE ENERGY USE PATTERNS

Another valuable lesson became evident as the partnership tried to estimate energy use patterns from a “periodic use facility,” such as a sports arena.

By 1999, Kauai had 29 of its smaller buildings completed—including fire stations, base yards, community centers, a convention hall and a stadium. In 2000, measurement and verification measures show that energy savings are at 83-85 percent of what the ESCo calculated in their original audit. Savings shortfalls have been especially evident at periodic-use facilities such as the Vidinha Stadium.

According to Sato, “Every time you add the human element, you’re also introducing an element of unpredictability. When

McDonald’s first came out with their Beanie Babies, people lined up in lines so long they reached out the doors! So, of course McDonald’s lost thousands of Btu’s during this period. Other unpredictable energy patterns can be seen in plug load—like people using space heaters in an air-conditioned office because they are too cold (this actually happened!). The same concept applies to sporting events and community festivals when facility managers have massive amounts of energy expended during short bursts of activities. Scheduling changes from year to year and it is difficult to establish a baseline.”

It is important to track the patterns of energy use to account for any changes in use from the baseline period. If any changes are detected, the calculation should reflect these corrections. If savings shortfalls still occur, the ESCo must stand by their guarantee and make up the difference.

## LESSON #4—MAKE SURE SAVINGS ARE GUARANTEED

ESCOs operate under the assumption that energy savings from their projects will save money for the building or facilities owner. What happens when energy savings are not realized after retrofits are completed by an ESCo? If the contract language guarantees the savings, the contracting ESCo pays the difference in energy savings projections and the actual energy bills. And this situation continues for the length of the performance contract—in this case, ten years.

According to Sato, the County depended on the ESCo to come up with the most economical plan to implement energy savings performance contracting. Sato explains, “We examined the numbers for reasonableness, but not to verify if they would meet the guarantee. The ESCo has the expertise and they are in the business to make their guarantees. If they fall short due to a miscalculation, the risk is with the ESCo, this is what we are paying for. We expect the ESCo to stand by their savings guarantee.”

#### **LESSON #5—AGREE ON WAYS TO MONITOR SAVINGS**

The County of Kauai also ran into a difficult scenario in measuring savings strictly accountable to the ESCo. Prior to the retrofit, the buildings would have an energy baseline; after the retrofit, meters would measure energy use. But what happens if the County adds energy-efficient equipment on its own volition?

The County could have put meters on every piece of equipment for accurate readings, but this option would be prohibitively expensive. According to energy consultant Clint Loughheed, it's common for building owners to not even monitor or verify savings at all! Some middle ground needed to be reached by all parties prior to retrofits.

#### **LESSON #6—EVALUATE DECISIONS FOR FUTURE WORK BASED ON PAST PERFORMANCE**

At Kauai's wastewater treatment plant, Sato and the plant's facilities managers decided not to go through with some proposed retrofits based on the unattained energy savings at Kauai's 29 smaller

facilities. Sato explains, “The energy savings could not pay for the cost to the measures. We looked at additional savings such as lower maintenance costs and even some CIP funds, but we could not make the program pay for itself.” “Based on the flow rates at the plant, it was decided the potential to save energy was insufficient to warrant the upgrades, with monetary savings data based on the 29 buildings.

#### **LESSON #7—DON'T BE A SLAVE TO THE “MASTER LEASE”**

Another problem arose when the ESCo decided to use a “master lease,” which bundles all the program components into one big package. The Kauai partnership decided to create an umbrella contract where an ESCo would be selected to do all three phases of the County's performance contract involving the Building Division, Wastewater Division and the Water Department. The County decided to bundle the projects to attract suitable ESCos to submit proposals.

Individually, the projects were deemed too small to entice an ESCo, but a combined project was attractive. In hindsight, Sato said that bundling the projects resulted in securing the services of an ESCo; however, it also made the ESCo less responsive in moving ahead in a timely manner because they knew that they had the contract. “If we had to do it again, I would put in incentive or penalty clauses to hold the contractor to a reasonable timeline.”

#### **LESSON #8—PAY THE ESCO AFTER SAVINGS ARE VERIFIED**

After the retrofit project is completed, savings need to be verified and “certificates of verification” issued, before a partnership

pays the ESCo. Otherwise, the partnership is operating on blind faith that the energy savings are a reality. Have the ESCo verify savings through an agreed-upon energy accounting software program, such as *METRIX*.

#### **LESSON #9—WORK WITH EXPERIENCED PROFESSIONALS**

None of the parties involved in the Kauai Rebuild America project had experience with performance contracting and were perhaps overly cautious in some areas—such as the indemnification issue—and too trusting in other areas—such as the monitoring issue.

Glenn Sato can not overemphasize the importance of having a professional on-hand to talk “engineer to engineer.” Sato says, “It was most beneficial to have an expert advisor on site, like Dr. Hanson. An objective third party gave credence to the process and made us feel comfortable with each decision.”

#### **LESSON #10—LEARN FROM PEERS**

Sato broke new ground with performance contracting, and had few peers on the islands of Hawaii from which to learn. Perhaps attending regional Peer Exchanges and country-wide National Forums are another way to interact with and learn from peers within Rebuild America.

#### **CASE STUDY #2: HAWAII STATE DEPARTMENT OF EDUCATION**

**Background:** In view of the limited available funding for repairs and maintenance of State of Hawaii school facilities, the State Department of Education (DOEd) partnership sought to finance, replace and

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renovate existing energy equipment by performance contracts. It was envisioned that the monetary savings from the decrease in energy consumption of new equipment would be used to pay for the costs of the replacement and renovation.

Gene Fong, the DOEd Energy Project Engineer, was assigned to oversee the project. The plan calls for improvement to the buildings and facilities of over 250 schools with 18.6 million square feet of space in the Department's educational system.

The work was planned to take place over two distinct phases. The first phase was a pilot performance contract for three schools on the Island of Oahu, with a combined floor space of 278,000 square feet, to determine if this approach to retrofitting schools was appropriate, feasible and cost-effective. The three schools selected for the pilot were Roosevelt High, Koko Head Elementary School, and Lunalilo Elementary School. Oak Ridge National Laboratory (ORNL) provided technical assistance during this phase by reviewing the technologies in the proposals. Based on the results of the first phase, the second phase would be to issue similar contracts for Hawaii's remaining schools.

The Phase I energy audit conducted by a lighting contractor showed that there were sufficient cost savings from energy consumption reduction to retrofit bulbs and ballasts, but not for replacement of the light fixtures. The contract was issued accordingly. The contractor initially constructed a bank of light fixtures for demonstration. Inspection of these fixtures showed that the product did not meet DOEd expectations and the contract was terminated.

The Department of Education had decided that, based on the outcome of the pilot

performance contract on the three schools in Phase I, performance contracting would not be cost-effective for Phase II. The Department decided to investigate other sources of funding—including lease purchase, request for increases in repair and maintenance budgets and municipal leasing.

Municipal leasing allows a state or local government to assume some of its own risk for borrowing money, at rates much lower than prime, or what an ESCo may offer through a commercial lease. With municipal leasing, government and non-profits are granted tax breaks through selected financing companies.

As part of Phase II, another project was initiated to retrofit/replace the lighting at Baldwin High School, on Maui Island, in partnership with Maui Electric Co. (MECO). The energy audit confirmed what was found on Oahu; savings in energy reduction will only cover the costs of replacement of lamps and ballasts (with a five-year pay back). The Department is presently preparing bid solicitation documents to select a contractor to replace lamps and ballasts.

Also as part of Phase II, in partnership with DOEd, Maui School District Office, Maui Schools, MECO, DBEDT, and HECO is preparing to conduct energy audits of the public schools on Maui with a total area of approximately 1.36 million square feet. This audit basically will determine where whole light fixtures will be replaced and where only lamps and ballasts will be replaced. This project will form the basis for DOEd future action in other school districts in Hawaii.

**The following is the second set of lessons learned about performance contracting:**

### LESSON #11—DO A PRELIMINARY IN-HOUSE ENERGY SURVEY

The original goal of performance contracting was to pay for the replacement or the renovation of old, dilapidated equipment with the money savings from reduction of energy usage of the new or renovated equipment.

Doing a preliminary, in-house survey will help any community partnership to determine if a project is realistic in meeting this goal—without incurring any liability or “sales pressure” to go forward with the project. The information from the survey will also enable the partnership to negotiate a fair contract with the ESCo with some sense of confidence if the project is feasible.

### LESSON #12—SPELL OUT THE DETAILS

The original intention was to give the ESCo a free hand so that they could propose the maximum energy savings. Accordingly, no details were specified in the proposal solicitation. After the ESCos submitted their proposals, it was apparent that only a lighting retrofit was feasible. Even then, it was unclear what “retrofit” meant. It was not clear until the retrofitted fixtures were available for inspection.

At that time, it became evident that the DOEd's expectations were far more than what the contractor provided, especially from an esthetic point of view. The retrofitted fixtures were still old and rusty. DOEd expected that the retrofitted light fixtures would look like new ones and would last nearly as long. However, the contract's proposal did not make clear that there were

insufficient monetary savings to renovate the fixtures. To avoid such misunderstanding, specific requirements should be clearly stated in the proposal.

#### **LESSON #13—ASSUME THE UNFORESEEN**

Even the best energy audit can't predict what will happen after the retrofit starts. As the contractor started work on the DOEd schools, he found out that in many cases the fixtures' wiring was frayed and needed replacement. The energy audit of the schools showed that the monetary savings from energy reduction could only marginally cover the costs of the retrofit. There were no funds for the wiring replacement. It is therefore, necessary to have contingency funds for unforeseen items.

#### **LESSON #14—SEE IF APPROPRIATE REPLACEMENT EQUIPMENT IS AVAILABLE**

If the retrofit had proceeded, the schools' facilities personnel would have to replace broken diffusers. The State's central procurement agency—the Department of Accounting and General Services (DAGS)—informed DOEd that DAGS did not stock the different types of diffusers that would be required to retrofit all schools. Efforts should be made to standardize equipment which may mean revising procurement regulations.

#### **LESSON #15—MAKE SURE THE END-USER IS HAPPY**

The project must satisfy the end-users. In the pilot project, the contractor proposed to retrofit some fixtures with one lamp from the original two lamps. Some teachers perceived that the single lamp illumination was more uneven and that this could lead to more eye fatigue and possibly poor

performance. Standards of performance, comfort, and lighting level requirements should be pointed out in the solicitation specifications.

#### **LESSON #16—CALCULATE SAVINGS IN MONETARY AND ENERGY UNITS**

The Department of Education learned a hard lesson after they realized that the selected lighting contractor only calculated energy savings in monetary units, i.e. dollars. Since energy prices fluctuate on an open market, these monetary units quickly became meaningless. The guaranteed savings should be enumerated in KWH and dollar value and included in the contract.

#### **LESSON #17—DETERMINE WHO IS RESPONSIBLE FOR MAINTENANCE**

The contract should clearly specify the maintenance and repair responsibilities. In the pilot contract, the contractor was only willing to maintain the items he replaced. When there was trouble with a fixture, it is very costly to have the school determine the problem and call the proper state organization to do the repairs. To correct this problem, it may be better to define the maintenance responsibility by physical structure, such as the room wall. In other words, the contractor should repair and maintain everything within the room, and this should be clearly defined in the contract.

#### **LESSON #18—ASSESS HOURS OF USAGE**

In calculating energy savings, the hours of usage (KWH) is the important factor, not just the KW rate of the equipment. As energy use patterns were being considered in the pilot contract, an ironic "problem" became apparent—the hours of usage were

insufficient to achieve projected energy savings. Typical commercial buildings are in operation for twelve or fourteen hours; schools are open about eight hours. The savings from a performance contract for a school with shorter hours would not support the total cost of the contract.

#### **LESSON #19—DON'T BUNDLE SCHOOLS**

In Hawaii's case, it made more sense to show savings from individual schools. The savings is accrued to each school, giving an incentive to each school to conserve energy.

#### **LESSON #20—MINIMIZE PLUG LOAD**

Plug load is perhaps the least efficient expenditure of energy in a building. Upgrading a building's HVAC and lighting avoids the use of inefficient "plugged-in" appliances such as window air conditioning units and task lighting.

#### **PEER EXCHANGE AT ITS BEST**

Part of Rebuild America's mission is to pass on information from one community partnership to other partnerships facing similar challenges—commonly called "peer exchange." One vehicle through which Rebuild Hawaii shares its successes and lessons learned in performance contracting is through its *Guide to Energy Performance Contracting*. Other Rebuild America partnerships have found it a useful tool, particularly in the area of measurement and verification.

This workbook, along with *Measurement and Verification of Energy Savings*, is available at [www.hawaii.gov/dbedt/ert](http://www.hawaii.gov/dbedt/ert).

# PERFORMANCE CONTRACTING

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Glenn Sato, Gene Fong, and many of the Rebuild Hawaii Consortium members have had direct input in developing this guide. Sato commented, "I wish I had this workbook to guide me in developing my program. Unfortunately, I was in the forefront of performance contracting in Hawaii and a lot of what I learned is in this workbook. Fortunately for those that follow, they can learn from my experiences."

The Rebuild America partnerships in Hawaii were rewarded for helping other partnerships at the Rebuild America National Forum in Las Vegas: Rebuild Hawaii Consortium members won three of the eleven 1999 Rebuild America Energy Champion Awards.

Elizabeth Raman won the 1999 Rebuild America State Representative of the Year Award, which recognized her success in leveraging resources in Hawaii, and for her role in achieving the tremendous energy savings seen in the Consortium's performance contracting projects. Maurice Kaya accepted the 1999 Rebuild America Award for Energy Excellence in State Government.

Raman comments, "We are grateful for this recognition. We have always hoped that the Rebuild Hawaii Consortium could play an active as a catalyst for energy savings. By bringing together teams of experts from various state government facilities and providing technical assistance through consulting services, I believe we are matching up energy problems with energy solutions in our community."